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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,060	09/28/2001	Hong Shi	BP 2057	4206

7590 10/19/2005

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EXAMINER	
NGUYEN, TUAN HOANG	
ART UNIT	PAPER NUMBER
2643	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/966,060	SHI, HONG	
	Examiner	Art Unit	
	Tuan H. Nguyen	2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *08/27/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 08/27/2003 has been considered by Examiner and made of record in the application file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abramsky et al. (U.S PAT. 6,052,566 hereinafter, "Abramsky") in view of Kamgar et al. (U.S PAT. 6,324,387 hereinafter, "Kamgar") and further in view of Hutchison, IV et al. (U.S PAT. 5,722,061 hereinafter, "Hutchison").

Regarding claim 1, Abramsky discloses a method for adjusting the gain of a Low Noise Amplifier (LNA) in an RF unit that includes the LNA, a mixer coupled to the output

of the LNA, a Band Pass Filter (BPF) coupled to the output of the mixer, a first received signal strength indicator (RSSI_A) coupled to measure the wideband signal strength at the output of the mixer, and a second received signal strength indicator (RSSI_B) coupled to measure the narrowband signal strength after the BPF, the method comprising: determining that a signal of interest is not present in a received RF signal present at an input of the LNA (col. 3 lines 16-35); measuring wideband signal strength at the output of the mixer (RSSI_A) (col. 5 lines 25-36). Abramsky differs from the claimed invention in not specifically teaching to determine that intermodulation interference exists; and adjusting the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly. However, Kamgar teaches to determine that intermodulation interference exists (col. 3 lines 22-35); and adjusting the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly (col. 2 lines 50-62). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Abramsky to provide a controlled receive device and method which dynamically adjust the gain of a low noise amplifier to an optimal value by discrete gain steps. Abramsky and Kamgar, in combination, fails to discloses measuring narrowband signal strength after the BPF (RSSI_B). However, Hutchison teaches measuring narrowband signal strength after the BPF (RSSI_B) (col. 5 lines 20-35). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Hutchison into view of Abramsky and Kamgar, in order to

adjust the gain of a receive circuit, thereby improving a receiver's immunity to interference.

Regarding claim 2, Hutchison further discloses determining that intermodulation interference exists comprises: adjusting the LNA gain by a gain adjustment step (col. 5 lines 16-19); measuring again narrowband signal strength after the BPF (RSSI_B') (col. 5 lines 20-35); and determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step, such determination indicating the presence of intermodulation interference (col. 9 lines 40-48).

Regarding claims 3 and 8, Hutchison further discloses determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step is determined by comparing the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain (col. 11 and col. 12 claim 6).

Regarding claims 4 and 9, Abramsky further discloses not adjusting the LNA gain when RSSI_A is less than a predefined threshold (THRS_B) (col. 9 lines 4-9).

Regarding claims 5 and 10, Abramsky further discloses determining that intermodulation interference exists is performed only when RSSI_A is greater than a predefined threshold (THRS_B) (col.9 lines 25-33).

Regarding claims 6 and 11, Abramsky further discloses reducing the LNA gain when RSSI_A exceeds a predefined threshold (THRS_A) (col. 9 lines 25-27).

Regarding claim 7, Abramsky discloses adjusting the gain of a Low Noise Amplifier (LNA) in an RF unit that includes the LNA, a mixer coupled to the output of the LNA, a Band Pass Filter (BPF) coupled to the output of the mixer, a first received signal strength indicator (RSSI_A) coupled to measure the wideband signal strength at the output of the mixer, and a second received signal strength indicator (RSSI_B) coupled to measure the narrowband signal strength after the BPF, the method comprising: determining that a signal of interest is not present in a received RF signal present at an input of the LNA (col. 3 lines 16-35); measuring wideband signal strength at the output of the mixer (RSSI_A) (col. 5 lines 25-36). Abramsky differs from the claimed invention in not specifically teaching to adjust the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly. However, Kamgar teaches to adjust the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly (col. 2 lines 50-62). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Abramsky to provide a controlled receive device and method which dynamically adjust the gain of a low noise amplifier to an optimal value by discrete gain steps. Abramsky and Kamgar, in combination, fails to discloses measuring narrowband signal strength after the BPF (RSSI_B); adjusting a gain (the LNA gain) of the LNA; determining that intermodulation interference exists by: adjusting the LNA gain by a gain

adjustment step; measuring again a signal strength after the BPF (RSSI_B'); and determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step. However, Hutchison teaches measuring narrowband signal strength after the BPF (RSSI_B) (col. 5 lines 20-35); adjusting a gain (the LNA gain) of the LNA (col. 5 lines 16-19); determining that intermodulation interference exists by: adjusting the LNA gain by a gain adjustment step (col. 5 lines 16-19); measuring again a signal strength after the BPF (RSSI_B') (col. 5 lines 20-35); and determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step (col. 9 lines 40-48). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Hutchison into view of Abramsky and Kamgar, in order to adjust the gain of a receive circuit, thereby improving a receiver's immunity to interference.

Regarding claim 12, Abramsky discloses a first received signal strength indicator coupled to the output of the mixer that indicates a wideband received signal strength (RSSI_A) (col. 5 lines 25-36). Abramsky differs from the claimed invention in not specifically teaching a Radio Frequency unit comprising: a transmit/receive block that couples to an antenna; transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device, that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission; a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal; a mixer coupled to receive an output of the LNA;

a Band Pass Filter (BPF) coupled to an output of the mixer; and an LNA gain adjustment block that operates to: determine that intermodulation interference exists; and adjusts the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly. However, Kamgar teaches a Radio Frequency unit comprising: a transmit/receive block that couples to an antenna (Fig. 1 col. 3 lines 11-35); transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device (Fig. 1 item 130), that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission (Fig. 1 items 135 and 140); a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal (Fig. 1 item 105); a mixer coupled to receive an output of the LNA (Fig. 1 part of item 130); a Band Pass Filter (BPF) coupled to an output of the mixer (Fig. 1 part of item 130); and an LNA gain adjustment block that operates to: determine that intermodulation interference exists (col. 3 lines 22-35); and adjusts the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly (col. 2 lines 50-62). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Abramsky to provide a controlled receive device and method which dynamically adjust the gain of a low noise amplifier to an optimal value by discrete gain steps. Abramsky and Kamgar, in combination, fails to discloses a second received signal strength indicator coupled after the BPF that indicates a narrowband received signal strength (RSSI_B). However, Hutchison teaches a second received signal strength indicator coupled after the BPF that indicates a narrowband received

signal strength (RSSI_B) (col. 5 lines 20-35). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Hutchison into view of Abramsky and Kamgar, in order to adjust the gain of a receive circuit, thereby improving a receiver's immunity to interference.

Regarding claims 13 and 22, Hutchison further discloses determining that intermodulation interference exists comprises, the LNA gain adjustment block: records RSSI_B (Fig. 15 item 1515 col. 8 lines 43-53); adjusts the LNA gain by a gain adjustment step (Fig. 4 col. 6 lines 12-25); records a new RSSI_B (RSSI_B') (Fig. 15 item 1515 col. 8 lines 54-61); and determines that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step, such determination indicating the presence of intermodulation interference (col. 9 lines 40-48).

Regarding claims 14, 18 and 23, Hutchison further discloses determining that intermodulation interference exists, the LNA gain adjustment block compares the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain (col. 11 and col. 12 claim 6).

Regarding claims 15, 19 and 24, Abramsky further discloses the LNA gain adjustment block does not adjust the LNA gain when RSSI_A is less than a predefined threshold (THRS_B) (col. 9 lines 4-9).

Regarding claims 16, 20 and 25, Abramsky further discloses 16. The Radio Frequency unit of claim 12, wherein the LNA gain adjustment block reduces the LNA gain when RSSI_A exceeds a predefined threshold (THRS_A) (col. 9 lines 25-27).

Regarding claim 17, Abramsky discloses a first received signal strength indicator coupled to the output of the mixer that indicates a wideband received signal strength (RSSI_A) (col. 5 lines 25-36). Abramsky differs from the claimed invention in not specifically teaching a Radio Frequency unit comprising: a transmit/receive block that couples to an antenna; transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device, that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission; a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal; a mixer coupled to receive an output of the LNA; a Band Pass Filter (BPF) coupled to an output of the mixer; and adjusts the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly. However, Kamgar teaches a Radio Frequency unit comprising: a transmit/receive block that couples to an antenna (Fig. 1 col. 3 lines 11-35); transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device (Fig. 1 item 130), that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission (Fig. 1 items 135 and 140); a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal (Fig. 1 item 105); a mixer coupled to receive an output of

the LNA (Fig. 1 part of item 130); a Band Pass Filter (BPF) coupled to an output of the mixer (Fig. 1 part of item 130); and adjusts the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly (col. 2 lines 50-62). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Abramsky to provide a controlled receive device and method which dynamically adjust the gain of a low noise amplifier to an optimal value by discrete gain steps. Abramsky and Kamgar, in combination, fails to discloses a second received signal strength indicator coupled after the BPF that indicates a narrowband received signal strength (RSSI_B); an LNA gain adjustment block that operates to: records RSSI_B; adjusts the LNA gain by a gain adjustment step; records a new RSSI_B (RSSI_B'); and determines that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step, such determination indicating the presence of intermodulation interference. However, Hutchison teaches a second received signal strength indicator coupled after the BPF that indicates a narrowband received signal strength (RSSI_B) (col. 5 lines 20-35); an LNA gain adjustment block that operates to: records RSSI_B (Fig. 15 item 1515 col. 8 lines 43-53); adjusts the LNA gain by a gain adjustment step (Fig. 4 col. 6 lines 12-25); records a new RSSI_B (RSSI_B') (Fig. 15 item 1515 col. 8 lines 54-61); and determines that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step, such determination indicating the presence of intermodulation interference (col. 9 lines 40-48). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Hutchison into view

of Abramsky and Kamgar, in order to adjust the gain of a receive circuit, thereby improving a receiver's immunity to interference.

Regarding claim 21, Abramsky discloses a first received signal strength indicator coupled to the output of the mixer that indicates a wideband received signal strength (RSSI_A) (col. 5 lines 25-36). Abramsky differs from the claimed invention in not specifically teaching a Radio Frequency unit comprising: a transmit/receive block that couples to an antenna; transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device, that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission; a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal; a mixer coupled to receive an output of the LNA; a Band Pass Filter (BPF) coupled to an output of the mixer; and adjusts the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly. However, Kamgar teaches a Radio Frequency unit comprising: a transmit/receive block that couples to an antenna (Fig. 1 col. 3 lines 11-35); transmit circuitry that receives Intermediate Frequency (IF) transmit data from a host device (Fig. 1 item 130), that converts the IF transmit data to an RF transmit signal and that couples the RF transmit signal to the transmit/receive block for transmission (Fig. 1 items 135 and 140); a Low Noise Amplifier (LNA) operably coupled to the transmit/receive block to receive an RF receive signal (Fig. 1 item 105); a mixer coupled to receive an output of the LNA (Fig. 1 part of item 130); a Band Pass Filter (BPF) coupled to an output of the

mixer (Fig. 1 part of item 130); and adjusts the gain of the LNA based upon the existence of the intermodulation interference to cause the mixer to operate linearly (col. 2 lines 50-62). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Abramsky to provide a controlled receive device and method which dynamically adjust the gain of a low noise amplifier to an optimal value by discrete gain steps. Abramsky and Kamgar, in combination, fails to discloses an LNA gain adjustment block that operates to: determine that intermodulation interference exists based upon RSSI_A and a narrowband received signal strength (RSSI_B) received from a coupled baseband processor. However, Hutchison teaches an LNA gain adjustment block that operates to: determine that intermodulation interference exists based upon RSSI_A and a narrowband received signal strength (RSSI_B) received from a coupled baseband processor (col. 5 lines 20-35). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Hutchison into view of Abramsky and Kamgar, in order to adjust the gain of a receive circuit, thereby improving a receiver's immunity to interference.

4. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamgar et al. (U.S PAT. 6,324,387 hereinafter, "Kamgar") in view of Hutchison, IV et al. (U.S PAT. 5,722,061 hereinafter, "Hutchison").

Regarding claim 26, Kamgar discloses determining whether intermodulation interference exists in an RF unit that includes a Low Noise Amplifier (LNA), a mixer coupled to the output of the LNA, and a Band Pass Filter (BPF) coupled to the output of the mixer, the method comprising: adjusting the LNA gain by a gain adjustment step (RSSI_A) (col. 5 lines 16-19). Kamgar differs from the claimed invention in not specifically teaching to measure narrowband signal strength after the BPF (RSSI_B); measuring again a signal strength after the BPF (RSSI_B'); and determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step. However, Hutchison teaches to measure narrowband signal strength after the BPF (RSSI_B) (col. 5 lines 20-35); measuring again a signal strength after the BPF (RSSI_B') (col. 5 lines 20-35); and determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step (col. 9 lines 40-48). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Kamgar to adjust the gain of a receive circuit, thereby improving a receiver's immunity to interference.

Regarding claim 27, Hutchison further discloses determining that the difference between RSSI_B and RSSI_B' is not linearly related to the gain adjustment step is determined by comparing the difference between RSSI_B and RSSI_B' to a threshold that is based upon the LNA gain (col. 11 and col. 12 claim 6).

Regarding claim 28, Abransky further discloses not adjusting the LNA gain when

RSSI_A is less than a predefined threshold (THRS_B) (col. 9 lines 4-9).

Conclusion

5. Any response to this action should be mailed to:

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is (571)272-8329. The examiner can normally be reached on 8:00Am - 5:00Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on (571)272-7499. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Nguyen

Examiner

Art Unit 2643

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